IS 6613 (2002): Neutral Spirit for Alcoholic Drinks [PCD 9: Organic Chemicals Alcohols and Allied Products and Dye Intermediates]

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(पहला पुनरीक्षण)

Indian Standard

NEUTRAL SPIRIT FOR ALCOHOLIC DRINKS — SPECIFICATION

(First Revision)

ICS 67.160.10; 71.080.60

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 2002

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Alcohols and Allied Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

The neutral spirit for alcoholic drinks, also known as 'Silent spirit' is the principal raw material for all Indian Made Foreign Liquors (IMFL), such as Gin, Vodka, Whisky and Brandy. The requirements of Grade 1 rectified spirit covered by IS 323 : 1959 'Rectified spirit (*revised*)' are considered to be inferior, thus they fail to qualify for use in the manufacture of alcoholic drinks. A number of Indian Standards for alcoholic drinks have been prepared and their implementation is linked with the specification of the base material, namely neutral spirit. This standard has been prepared to ensure an optimum quality of spirit for the manufacture or blending of alcoholic drinks.

This standard was first published in 1972. In the present revision the neutral spirit is further classified into different types according to the raw materials from which it is being manufactured and the requirements have been made more stringent. Provisions for handling and storage have been incorporated.

The composition of the Committee responsible for formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 MARCH 2011
TO
IS 6613 : 2002 NEUTRAL SPIRIT FOR ALCOHOLIC DRINKS — SPECIFICATION

(First Revision)

(*Page* 2, *Table* 1, *col heading* 3) **—** Delete the word 'General'.

(*Page* 2, *Table* 1, *col* 4) — Delete.

[*Page* 2, *Table* 1, *Sl No.* (i), *col* 2] — Add the word '*Max*' after '20/20°C'.

[*Page* 2, *Table* 1, *Sl No.* (x), *col* 3] — Substitute '0.5' *for* '0.000 5'.

(*Page* 2, *clause* **5.3.2**) — Insert the following at the end:

'f) Any other marking required under the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977 and any other statutory requirement.'

Indian Standard

NEUTRAL SPIRIT FOR ALCOHOLIC DRINKS — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for neutral spirit intended for use in the manufacture of alcoholic drinks.

2 REFERENCES

The following Indian Standards contain provisions, which through reference in this text constitute provisions of the standards. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based or this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
323 : 1959	Rectified spirit (*revised*)
878 : 1975	Graduated measuring cylinders (*first revision*)
3752 : 1988	Methods of test for alcoholic drinking (*first revision*)
1070 : 1992	Reagent grade water (*third revision*)

3 TERMINOLOGY

For the purpose of this standard the following definitions shall apply.

3.1 Neutral Spirit

Neutral spirit is ethanol, which will only have the characteristic taste and odour of ethanol. It is manufactured from molasses, grains and other carbohydrate raw materials.

3.2 In order to classify the different types of neutral spirit according to the raw materials used for the manufacture, the value of the raw material should be prefixed as follows.

3.2.1 *Molasses Neutral Spirit*

Neutral spirit made from molasses will be called molasses neutral spirit.

3.2.2 *Grain Neutral Spirit*

Neutral spirit made from grain or malt will be named as grain neutral spirit.

3.2.3 Similarly prefix will be used according to raw material used for manufacture.

4 REQUIREMENTS

The material shall comply with the requirements given in Table 1 when tested according to the methods given in col 5 and 6 of Table 1.

5 PACKING AND MARKING

5.1 Packing

5.1.1 The material shall be packed in such containers as agreed to between the purchaser and the supplier, subject to the provisions of law in force for the time being.

5.1.2 Old and rusted containers shall not be used for storage or transportation of neutral spirit.

5.1.3 Necessary safeguards against the risk arising from the storage and handling of large volume of flammable liquids shall be provided, and all due precautions shall be taken at all times to prevent accident by fire or explosion.

5.1.4 Except when they are opened for the purpose of cleaning and rendering them from alcohol vapour, all containers shall be kept securely closed unless they have been thoroughly cleaned and freed from alcohol vapour.

5.2 Handling and Storage of Neutral Spirit

Neutral spirit being odourless and tasteless, care should be taken in the handling and storage to try to prevent it acquiring odour and taste from other materials.

Piping and tanks which are to be used for neutral spirit shall be checked carefully, and shall be drained and flushed out with some neutral spirit (which is recycled to distillations), prior to use. Carbon steel storage tanks may be used for storage of neutral spirit, provided the main discharge valve is located minimum one inch above the bottom of the tank, to allow rust particles to accumulate in the sump, which shall be drained as necessary, at least once a year.

Stainless steel hoses shall be used where necessary. Rubber or plastic hoses or gaskets may be used, only after testing for any reaction with neutral spirit. This

Table 1 Requirements for Neutral Spirit for Alcoholic Drinks

(*Clause* 4)

Sl No.	Characteristic	Requirements		Methods of Test, Ref to	
		General	For Vodka	Annex/Clause	Annex of IS 323
(1)	(2)	(3)	(4)	(5)	(6)
i)	Relative density at 20/20°C	0.806 92	0.806 92	—	B
ii)	Ethanol percent (*v/v* at 20°C), *Min*	96	96	—	C
iii)	Miscibility with water	Miscible	Miscible	—	D
iv)	Acidity as acetic acid, g/100 l, absolute alcohol, *Max*	1.5	1.5	—	E
v)	Residue on evaporation, g/100 l, absolute alcohol, *Max*	1.5	1.5	—	F
vi)	Esters as $CH_3COOC_2H_5$ g/100 l, absolute alcohol, *Max*	1.3	1.3	—	H
vii)	Lead, g/100 l, absolute alcohol, *Max*	0.1	0.1	—	K
viii)	Methyl alcohol g/100 l of absolute alcohol, *Max*	50	50	16 of IS 3752	—
ix)	Furfural	Not detectable	Not detectable	—	N
x)	Aldehyde as acetaldehyde g/100 l, absolute alcohol, *Max*	0.000 5	0.000 5	A	—
xi)	Permanganate reaction time, in minutes, absolute alcohol, *Min*	30	30	B	—
xii)	Copper (as Cu), g/100 l, absolute alcohol, *Max*	0.002	0.002	15 of IS 3752	—
xiii)	Higher alcohol as *iso*-amyl alcohol, g/100 l, absolute alcohol, *Max*	30	30	11.2 of IS 3752	—

may be done by immersing shavings of the material in a jar of neutral spirit for at least 48 h. A sample of the spirit should then be diluted to about 20 percent *v/v* and compared visually and organoleptically with a fresh sample of the same neutral spirit. If there is some cloudiness due to hydrocarbons, or if the sample has picked up a odour which is not present in the original, the hose or gasket should be considered unacceptable.

5.3 Marking

5.3.1 All containers in which the material is stored or transported shall be marked as prescribed by law in force from time-to-time.

5.3.2 In addition each container shall be marked with:

a) Name of the manufacturer;

b) Name of the product;

c) Product to be used for;

d) Month and year of manufacture; and

e) Lot or Batch number.

5.3.3 *BIS Certification Marking*

The container may also be marked with the Standard Mark.

5.3.3.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material shall be drawn as prescribed in Annex A of IS 323.

7 TEST METHODS

7.1 Test shall be conducted according to the methods prescribed in col 4 and 5 of Table 1.

7.2 Quality of Reagent

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in the test.

NOTES

1 'Pure chemicals' shall mean chemicals that do not contain impurities, which effect the result of analysis.

2 Fresh solution should be prepared from time-to-time for the analysis, which shall give correct report.

ANNEX A

[*Table* 1, *Sl No.* (x)]

DETERMINATION OF ALDEHYDE

A-1 OUTLINE OF THE METHOD

Aldehyde content is determined by Iodine titration, using excess of Iodine. Excess of Iodine is titrated against Sodium thiosulphate solution.

A-2 REAGENTS

A-2.1 Standard Sodium Thiosulphate Solution ($Na_2S_2O_3$)

0.005 N.

A-2.2 Iodine Solution

Approximately 0.05 N.

A-2.3 Sodium Bisulphite Solution ($NaHSO_3$) or Sodium Meta Bisulphite

Approximately 0.05 N.

NOTE — This solution will not deteriorate if it contains about 10 percent alcohol; it should not be used after one week.

A-2.4 Starch Indicator

Mix about 2 g of soluble starch with cold water to a thin paste. Add about 200 ml of boiling water stirring constantly and immediately discontinue heating. Add about 1 ml of mercury, shake and allow the starch to stand over mercury.

NOTE — Freshly prepared starch indicator shall be used for the test.

A-3 PROCEDURE

Place 100 ml of the material in a 500-ml flask, add 100 ml of water and excess sodium bisulphite solution (quantity of Sodium bisulphite solution depends on the aldehyde contents in the material, in routine work 20 ml Sodium bisulphite solution is found quite satisfactory) and allow it to stand for about 30 min, shaking occasionally. Add excess Iodine solution and titrate this excess with standard sodium thiosulphate solution using starch indicator. Run a blank on 100 ml of water using the same quantities of iodine solution and bisulphite solution as were used in the control test.

A-4 CALCULATION

Aldehydes (as CH_3CHO), g/100 ml = $22 (V - v) N$

where

V = Volume of standard sodium thiosulphate solution required for titration in control test,

v = Volume of standard sodium thiosulphate solution required for titration in the blank, and

N = Normality of sodium thiosulphate.

ANNEX B

[*Table* 1, *Sl No.* (xi)]

TEST FOR PERMANGANATE REACTION TIME

B-1 OUTLINE OF THE METHOD

Permanganate reaction time is determined by addition of potassium permanganate solution and observing the time for disappearance of pink colour.

B-2 APPARATUS

B-2.1 Graduated Measuring Cylinder

Stoppered, 100 ml capacity (*see* IS 878).

B-3 REAGENT

B-3.1 Standard Potassium Permanganate Solution

0.01 N (freshly prepared).

B-4 PROCEDURE

B-4.1 Clean thoroughly the graduated measuring cylinder first with concentrated hydrochloric acid, then with water and finally with material to be tested. Place 20 ml of the material in the cylinder, bring the temperature to 15°C by placing the cylinder in cold water, add 1.0 ml of standard permanganate solution by means of a 1-ml pipette noting down the exact time as soon as addition is over. Mix the contents at once and keep the cylinder at 15 to 16°C and away from bright light.

B-4.2 The material shall be taken to have satisfied the test if the pink colour does not disappear up to 30 min.

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Alcohols and Allied Products Sectional Committee, PCD 10

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Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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